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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,152	06/27/2001	Monty Aaron Forehand	STL9831/40046.137USU1	5205
23552	7590	08/25/2004	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			WANG, ALBERT C	

ART UNIT	PAPER NUMBER
2115	

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/894,152	FOREHAND ET AL.
	Examiner	Art Unit
	Albert Wang	2115

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-3 and 8-18 is/are rejected.
- 7) Claim(s) 4-7 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 27 June 2001 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

THOMAS LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

1. Original claims 1-18 are pending.

Claim Objections

2. Claim 1 is objected to because of the following informalities: “p1” before “(a)” is ignored. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 8 is rejected under 35 U.S.C. 102(e) as being anticipated by Hall, U.S. Patent No. 6,378,037.

As per claim 8, Hall discloses a disc drive having a data storage disc, an actuator for positioning a transducer over the data storage disc, a servo controller for positioning of the actuator for accessing data sectors in tracks on the data storage disc, an interface controller for communicating with a host computer, and a memory controller and buffer for caching incoming write commands (Fig. 1D, DASD 122 having cache controller 124 and cache memory 126; Col. 2, lines 16-30, write caching), the disc drive comprising:

a non-volatile write cache using an alternate power source to maintain integrity of data stored in the buffer in the event of a standard drive power loss (Col. 2, lines 30-64, “provide a non-volatile write cache (including uninterruptible power supply arrangements)”).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 9-13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall, U.S. Patent No. 6,378,037, in view of George, U.S. Patent No. 6,317,657.

As per claim 1, Hall teaches in a disc drive having a data storage disc, an actuator for positioning a transducer over the data storage disc, a servo controller for positioning of the actuator for accessing data sectors in tracks on the data storage disc, an interface controller for communicating with a host computer, and a memory controller and buffer for caching incoming write commands (Fig. 1D, DASD 122 having cache controller 124 and cache memory 126; Col. 2, lines 16-30, write caching), a method for maintaining the write commands cached in the memory buffer in the event of a power loss using an alternative power source (Col. 2, lines 30-64, “provide a non-volatile write cache (including uninterruptible power supply arrangements”)).

However, Hall does not teach details such as switching into a low-power conservation mode. George teaches a method, which may be applied to various systems (Col. 1, lines 10-21), for maintaining data cached in a memory buffer in the event of a power loss, comprising steps of:

- (a) detecting a standard drive power loss (Col. 3, lines 15-31, BBUM 108 monitors system power; Fig. 4, step 152, BBUM 108 asserts PDN* signal);
- (b) switching from standard drive power to an alternate drive power source (Col. 3, lines 15-31, switch from system power to battery power);

(c) switching the memory controller into a low-power consumption mode (Col. 3, lines 31-46, SRCM 104 is either in normal mode or self-refresh/battery-backup mode; Col. 3, line 58 – Col. 4, lines 15, SCRM 104 initiates transition from normal mode to self-refresh mode); and
(d) refreshing the write commands in the buffer (Col. 3, line 58 – Col. 4, lines 15, SDRAM 106 enters self-refresh mode).

At the time of the invention it would have been obvious to one of ordinary skill in the art to apply George's method to Hall's disc drive. A motivation for doing so would have been to prolong the life of the alternative power source (George, Col. 1, lines 46-61).

As per claim 2, George teaches the method according to claim 1 further comprising steps of:

- (e) detecting a recovery of standard drive power (Col. 3, lines 15-31; Fig. 4, step 160);
- (f) switching from the alternate drive power source to the standard drive power (Col. 4, lines 26-36);
- (g) switching the memory controller into a normal operation mode (Col. 4, lines 26-36).

Hall teaches (h) executing any pending write commands cached in the memory buffer (Col. 2, lines 41-56).

As per claim 9, George teaches the non-volatile write cache comprises:
an alternate power source (Col. 3, lines 15-31, battery contained within BBUM 108);
a power control circuit to switch power supplied to the memory controller and buffer between standard drive power and an alternate power source (Fig. 1, BBUM 108; Col. 3, lines 15-31).

As per claim 10, George teaches the memory controller and buffer can operate in a low-power consumption mode (Col. 3, lines 31-46).

As per claim 11, George teaches the power control circuit and memory controller can switch to the alternate power source according to the status of a system reset of the disc drive ((Col. 3, line 58 – Col. 4, lines 15)).

As per claims 12 and 13, George teaches the alternate power source is a battery (Col. 3, lines 15-31).

As per claim 16, George teaches the power control circuit acts as a multiplexer (Col. 3, lines 15-31).

As per claim 17, Hall teaches the memory controller is integrated in the interface controller (Fig. 1D).

5. Claims 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall/George as applied to claims 2 and 8 above, and further in view of Fukushima et al., U.S. Patent No. 6,289,416 (“Fukushima”).

As per claim 3, Hall/George does not expressly teach details of the write commands cached in the memory buffer further such as comprising a Logical Block Address (LBA) of the write command. Fukushima teaches caching LBA in a memory buffer (Fig. 2, cache memory 21 contains LBA). At the time of the invention it would have been obvious to one of ordinary skill in the art to apply Fukushima’s caching of LBA to Hall/George’s disc drive. A motivation for doing so would have been to ensure the integrity of the write commands.

As per claim 18, Fukushima teaches a memory controller that is external to the interface controller (Fig. 2, MPU 16 is external to interface 15).

6. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hall/George as applied to claim 11 above, and further in view of Weber, U.S. Patent No. 5,596,708.

As per claims 14 and 15, Hall/George does not teach a capacitor as an alternative power source. By teaching that an alternative power source that may be either a battery or a capacitor (Col. 7, lines 1-11), Weber shows that selection of the type of power source is a matter of design. Thus at the time of the invention, it would have been obvious to replace Hall/George's alternative power source with Weber's capacitor.

Allowable Subject Matter

7. Claims 4-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

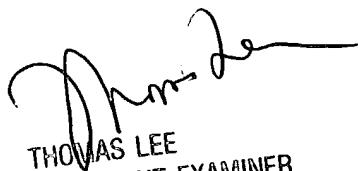
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert Wang whose telephone number is 703-305-5385. The examiner can normally be reached on M-F (9:30 - 6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas C. Lee can be reached on 703-305-9717. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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August 23, 2004



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